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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,277	06/01/2006	Takeo Tsukada	128242	3135

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EXAMINER	
DOUGHERTY, THOMAS M	
ART UNIT	PAPER NUMBER
2834	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,277	TSUKADA ET AL.	
	Examiner	Art Unit	
	Thomas M. Dougherty	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *606*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsukada et al. (JP 2001-220226). Tsukuda et al. show a piezoelectric ceramics having ceramic particles, wherein: said ceramic particles comprises bismuth layer (see SOLUTION) compound containing at least Sr, Ln (note that Ln is a lanthanoid element), Bi, Ti and O and including $M^{II}Bi_4Ti_4O_{15}$ type crystal (M^{II} is an element composed of Sr and Ln) as a main component, and an oxide of Mn as a subcomponent; and an average particle diameter by the code length measuring method is 0.8 to 4.7 μm (see paragraph [0020]).

Said $M^{II}Bi_4Ti_4O_{15}$ type crystal is expressed by a composition formula $(Sr_\alpha Ln_\beta)Bi_\gamma Ti4015$, and "α" satisfies $\alpha = 1-\beta$, " β " satisfies $0.01 \leq \beta \leq 0.50$ and "γ" satisfies $3.80 \leq \gamma \leq 4.50$. See paragraph [0034] and table 1 for the γ values.

A content of said oxide of Mn is 0.1 to 1.0 wt% in terms of MnO. See paragraph [0034].

The intent of the invention is to create a piezoelectric element, comprising a piezoelectric substance formed by the piezoelectric ceramics as set forth above. See paragraph [0022].

Tsukuda et al. show a piezoelectric ceramics having ceramic particles, wherein: said ceramic particles comprises bismuth layer (see SOLUTION) compound containing at least Sr, Ln (note that Ln is a lanthanoid element), Bi, Ti and O and including $M^{II}Bi_4Ti_4O_{15}$ type crystal (M^{II} is an element composed of Ca and Ln, see paragraphs [0008] and [0011]) as a main component, and an oxide of Mn as a subcomponent; and an average particle diameter by the code length measuring method is 1.0 to 4.5 μm (see paragraphs [0011] and [0020]).

Said $M^{II}Bi_4Ti_4O_{15}$ type crystal is expressed by a composition formula $(Ca_{1-\beta}Ln_\beta)Bi_\gamma Ti4015$, and " β " satisfies $0.01 \leq \beta \leq 0.50$ and "γ" satisfies $3.80 \leq \gamma \leq 4.50$. See paragraph [0034] and table 1 for the γ values.

A content of said oxide of Mn is 0.1 to 1.0 wt% in terms of MnO. See paragraph [0034].

The intent of the invention is to create a piezoelectric element, comprising a piezoelectric substance formed by the piezoelectric ceramics as set forth above. See paragraph [0022].

Claims 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Keisuke et al. (JP 2003-335577). Keisuke et al. teach (paragraph [0035]) a piezoelectric ceramics having ceramic particles, wherein: said ceramic particles comprises bismuth layer (see SOLUTION) compound containing at least Ba, Sr, Ln (note that Ln is a lanthanoid element), Bi, Ti and O and including $M^{II}Bi_4Ti_4O_{15}$ type crystal (M^{II} is an element composed of Ba, Sr and Ln) as a main component, and an

oxide of Mn as a subcomponent; and an average particle diameter by the code length measuring method is 0.8 to 4.7 μm (see paragraph [0022]).

Said $M^{II}Bi_4Ti_4O_{15}$ type crystal is expressed by a composition formula $(Ba_{1-\alpha-\beta}Sr_\alpha Ln_\beta)Bi_\gamma Ti4015$, and "α" satisfies $0.1 \leq \alpha \leq 0.6$, " β." satisfies $0.05 \leq \beta \leq 0.50$ and "γ" satisfies $3.80 \leq \gamma \leq 4.50$. See values in paragraph [0035].

A content of said oxide of Mn is 0.1 to 1.0 wt% in terms of MnO. See paragraph [0018] and, a content of said oxide of Ge is 0.05 to 0.5% in terms of GeO_2. See paragraph [0019].

The intent of the invention is to create a piezoelectric element, comprising a piezoelectric substance formed by the piezoelectric ceramics as set forth above. See the PROBLEM TO BE SOLVED SECTION of the Abstract where it is noted that the intent is to provide a piezoelectric device.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tsukada et al. (JP 2001-220226). Given the invention of Tsukuda et al. as noted above, they further note that a maximum value Q_{max} of "Q" (Q = IXI/R, wherein "X" is reactance and "R" is resistance) between a resonant frequency and an antiresonant frequency with respect to a third harmonic

wave of thickness vertical vibration is 8 or larger. See paragraphs [0007], [0040] and table 1 (see numbers 3-12 in the table where the range proceeds from almost 8 to above 11).

They further note that a maximum value Q_{max} of "Q" (Q = IXI/R, wherein "X" is reactance and "R" is resistance) between a resonant frequency and an antiresonant frequency with respect to a third harmonic wave of thickness vertical vibration is 6 or larger. See paragraphs [0007], [0040] and table 1 (see numbers 3-13 in the table where the range proceeds from almost 8 to above 11 and to above 6).

They do not note the frequency employed, e.g. 24 MHz and 6 MHz respectively.

The frequency employed is not further limiting to the structure as claimed and therefore carries no patentable weight, instead it tends toward the manner in which the device is to be employed. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham,* 2 USPQ2d 1647 (1987).

Claim 15 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Keisuke et al. (JP 2003-335577).

Given the invention of Keisuke et al. as noted above, they further note that a maximum value Q_{max} of "Q" (Q = IXI/R, wherein "X" is reactance and "R" is resistance) between a resonant frequency and an antiresonant frequency with respect to a third harmonic wave of thickness vertical vibration (paragraph [0007]) is 23 or larger (see table 1).

They do not note the frequency employed, e.g. 8 MHz.

The frequency employed is not further limiting to the structure as claimed and therefore carries no patentable weight, instead it tends toward the manner in which the device is to be employed. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham,* 2 USPQ2d 1647 (1987).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art cited reads on aspects of the claimed invention.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd

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October 6, 2007

Thomas M. Dougherty
Primary Examiner
Art Unit 2834